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30522 7590 09/21/2009 KRATON POLYMERS U.S. LLC 16400 Park Row HOUSTON, TX 77084				
EXAMINER KRYLOVA, IRINA				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

kratonip@kraton.com

# Office Action Summary

**Application No.**

10/589,705

**Applicant(s)**

MUYLDERMANS ET AL.

**Examiner**

Irina Krylova

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 13-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 13-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SE-US)  
Paper No(s)/Mail Date 04/30/07; 02/12/07
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 13, 16, 25, 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 13, 25 and 26 recite the broad recitation of the block copolymer having a total apparent molecular weight of at least 250 kg/mole, and the claims also recite at least 350 kg/mole which is the narrower statement of the range/limitation.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**2. Claims 13-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Mariotti et al** (IT 1,317,261) in view of **Diehl et al** (US 5,358,783), as evidenced by **Kolarik** (Polymer, 47, 2006, 346-356).

**3. Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising:

- 1) a mixture of 50 phr of high molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer; and 50 phr of a medium molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer (p. 4, lines 21-25; p. 5, lines 1-4);
- 2) 40-80 phr (Tables 2-3) of a polypropylene homopolymer comprising a commercially available isotactic crystalline polypropylene Moplen C30G (p. 5, lines 5-14) having the following characteristics (see **Kolarik**, Table 1):
  - a) T<sub>m</sub> of 166.9°C;
  - b) MFI of 6 g/10 min (as to instant claims 18-19);

- 3) 50 phr of paraffin oil (as to instant claim 21);
- 4) endothermic foaming agents comprising a mixture of sodium bicarbonate and citric acid (as to instant claim 22); and azodicarbonamide blowing agent ( p. 5, lines 20-24).

4. Since **Mariotti et al** discloses the use of commercially available crystalline polypropylene polymers available under the trade name of Moplen, and high molecular weight and medium molecular weight block copolymers commercially available under the trend name of Kraton, therefore, it would have been obvious to a one of ordinary skill in the art at the time of the invention was made to substitute the block copolymers Kraton G 1651 and Kraton G 1650 of **Mariotti et al** for analogous block copolymers Kraton MD 6933ES and Kraton G 1657; and Moplen C30G polypropylene polymer of **Mariotti et al** for analogous Moplen HP1078 or Moplen HP502L. Case law holds that the selection of a known material based on its suitability for its intended use supports prima facie obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

**5. Mariotti et al** fails to specify the molecular weights, amounts of styrene blocks in the copolymer, the ratio between the high molecular weight thermoplastic elastomer block copolymer and a medium molecular weight thermoplastic elastomer block copolymer being 100:(5-50).

**6. Diehl et al** comprises a blend of:

1) 40-95 parts of a first ABA block copolymer comprising polystyrene-polyisoprene-polystyrene block copolymer having (as to instant claim 17, cited in col. 4, lines 39-45):

- a) an average molecular weight of 90,000-250,000;
- b) polystyrene blocks having an average molecular weight of 8,000-17,000;
- c) styrene content of 10-24% (as to instant claims 14,15, cited in col. 2, lines 22-34);
- d) the polyisoprene has an average molecular weight of 80,000-225,000;

2) 5-60 parts of a second ABA block copolymer having:

- a') an average molecular weight of 60,000-110,000;
- b') the polystyrene block having an average molecular weight of 12,000-20,000 (as to instant claim 16, cited in col. 2, lines 35-45);
- c') styrene content of 25-50%;
- d') an average molecular weight of polyisoprene 30,000-70,000 (Table 1).

7. As to instant claim 14, since a) the content of styrene blocks in the first and second ABA block copolymers and b) the molecular weight of the styrene and polyisoprene blocks in the first and second ABA block copolymers are different, therefore, it would

have been obvious that blocks A in the first and second copolymers and blocks B in the first and second copolymers are different.

8. Though the average molecular weight of the polystyrene in the first ABA block copolymer (17,000) are not overlapping with the molecular weight of the styrene in the ABA block copolymer claimed in the instant invention, it is the examiner's position that the values are close enough that one of ordinary skill in the art would have expected the same properties. Case law holds that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

9. **Diehl et al** further teaches that the combination of the two block copolymers having different styrene content and different molecular weights provides a composition having improved cohesive strength and heat resistance (col. 3, lines 38-52; col. 2, lines 1-16).

10. Since

1) **Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising:

A) a mixture of high molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer; and a medium molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer;

B) a crystalline polypropylene homopolymer;

C) a paraffinic oil;

D) a nucleating agent;

but fails to specify the molecular weights, amounts of styrene blocks in the copolymer, ratio between the high molecular weight thermoplastic elastomer block copolymer and a medium molecular weight thermoplastic elastomer block copolymer;

2) **Diehl et al** comprises a blend of:

A1) 40-95 parts of a first ABA block copolymer comprising polystyrene-polyisoprene-polystyrene block copolymer having an average molecular weight of 90,000-250,000; polystyrene blocks having an average molecular weight of 8,000-17,000; styrene content of 25-50%; and

A2) 5-60 parts of a second ABA block copolymer having an average molecular weight of 60,000-110,000; the polystyrene block having an average molecular weight of 12,000-20,000, wherein the combination of the two block copolymers having different styrene content and different molecular weights provides a composition having improved cohesive strength and heat resistance (col. 3, lines 38-52; col. 2, lines 1-16); therefore,

it would have been obvious to a one of ordinary skill in the art at the time of the invention was made, to include the combination of the two block copolymers of **Diehl et al** in the foam composition of **Mariotti et al** to improve the cohesive strength and heat resistance of the foam composition of **Mariotti et al**.



11. Though the content of the nucleating agent in the specific examples of composition of **Mariotti et al** in view of **Diehl et al** is higher (30%wt, see Table 7) than the content of the nucleating agent in the composition claimed in the instant invention (3%wt), nevertheless, since the foaming process and the properties of the final foam depend on the content of foaming and nucleating agent, such limitation as the content of the foaming agent becomes a result effective variable, therefore, it would have been obvious to one skilled in the art at the time of the invention was made, to make variations in the content of the nucleating agent to obtain the desired degree of foaming of the composition and desired properties of the final foam. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

12. Since the content of the paraffin oil softener in the composition of **Mariotti et al** in view of **Diehl et al** is provided as "parts per rubber" (50 phr), whereas the content of the softener claimed in the instant invention is given as "parts by weight" (100 pbw), therefore, depending on the content of the propylene polymer in the composition, this claimed value of 100 pbw will either overlap or be close to the amount of 50 phr of the composition of **Mariotti et al** in view of **Diehl et al**. It is the examiner's position that the values will appear to be close enough that one of ordinary skill in the art would have expected the same properties. Case law holds that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same

properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

**13. Claims 13-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Mariotti et al** (IT 1,317,261) in view of **Nakagawa et al** (US 2004/0143061), as evidenced by **Kolarik** (Polymer, 47, 2006, 346-356).

14. The discussion with respect to **Mariotti et al** (IT 1,317,261) as evidenced by **Kolarik** (Polymer, 47, 2006, 346-356) set forth in paragraphs 3-4 above, is incorporated here by reference.

**15. Mariotti et al** fails to specify the molecular weights, amounts of styrene blocks in the copolymer, the ratio between the high molecular weight thermoplastic elastomer block copolymer and a medium molecular weight thermoplastic elastomer being 100:(5-50).

**16. Nakagawa et al** discloses a thermoplastic resin composition comprising:

- 1) 10-90% a low molecular weight hydrogenated block copolymer ABA having a number average molecular weight of less than 120,000;
- 2) 90-10% of a high molecular weight hydrogenated block copolymer ABA, having a number average molecular weight of 120,000 or more, preferably 170,000-300,000 ([0081], [0092]);

- 3) a polyphenylene ether ([0015]);
- 4) a paraffin oil ([0099]).

17. The block A comprises styrene, block B comprises butadiene ([0073]-[0075]).  
The content of polystyrene block in the high molecular weight block copolymer comprises 20-55% ([0092]).

18. The number average molecular weight of the styrene polymer block in the low molecular weight copolymer is 20,000 ([0085]).

**19. Nakagawa et al** further teaches that when only low molecular weight block copolymer or only high molecular weight block copolymer are used, excellent surface appearance, high impact strength and decrease in generation of foreign matter at the time of production, cannot be attained ([0082]).

20. Therefore, it would have been obvious to a one of ordinary skill in the art that a combination of LMW block copolymer and HMW block copolymer is important for improved surface appearance and high tensile strength of the resulting composition.

21. Since the physical properties of the composition, including tensile strength, depend on relative proportion of LMW block copolymer and HMW block copolymer, such limitation as relative proportion of the LMW block copolymer and HMW block copolymer

becomes a result effective variable, therefore, it would have been obvious to one skilled in the art at the time of the invention was made, to make variations in the content of LMW block copolymer and HMW block copolymer to obtain the desired combination of physical properties, including tensile strength and surface appearance. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

22. Since

1) **Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising:

A) a mixture of high molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer; and a medium molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer;

B) a crystalline polypropylene homopolymer;

C) a paraffinic oil;

D) a nucleating agent;

but fails to specify the molecular weights, amounts of styrene blocks in the copolymer, ratio between the high molecular weight thermoplastic elastomer block copolymer and a medium molecular weight thermoplastic elastomer block copolymer;

2) **Nakagawa et al** discloses a thermoplastic resin composition comprising:

a) 10-90% a low molecular weight hydrogenated block copolymer ABA having a number average molecular weight of less than 120,000;

b) 90-10% of a high molecular weight hydrogenated block copolymer ABA, having a number average molecular weight of 120,000 or more, preferably 170,000-300,000 ([0081], [0092]);

c) a polyphenylene ether ([0015]); wherein the composition comprises excellent surface appearance, high impact strength and decrease in generation of foreign matter at the time of production;  
therefore,

it would have been obvious to a one of ordinary skill in the art at the time of the invention was made to include the combination of LMW block copolymer and HMW block copolymer of **Nakagawa et al** into the composition of **Mariotti et al** to ensure the composition of **Mariotti et al** comprises excellent surface appearance, high impact strength and decrease in generation of foreign matter at the time of production ([0082] in **Nakagawa et al**).

**23. Claims 13-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Himes et al** (US 4,880,878) in view of **Leicht** (US 4,764,535) and **Mariotti et al** (IT 1,317,261).

**24. Himes et al** discloses a thermoplastic blend comprising (as to instant claims 13-17, cited in col. 2, lines 10-38):

A) 80-20 pbw of an elastomeric block copolymer having a formula of ABA, wherein

- a1) A block is monoalkenyl aromatic hydrocarbon having an average molecular weight of between 4,000-115,000, preferably 4,000-35,000 (col. 3, lines 30-35); contained in amount of 5-35%wt; A block comprises a polystyrene (see Table 2);
  - a2) B block is a hydrogenated (col. 2, lines 37-38) butadiene having an average molecular weight of between 20,000-450,000,
- B) 20-80 pbw of a block copolymer of the formula ABA, wherein:
- b1) each A block is monoalkenyl aromatic hydrocarbon having an average molecular weight of between 4,000-115,000, preferably 4,000-35,000 (col. 3, lines 30-35); contained in amount of 5-35%wt;
  - b2) B block is a hydrogenated (col. 2, lines 37-38) butadiene having an average molecular weight of between 20,000-450,000;
- C) 50 phr of polypropylene (as to instant claim 18, see Table 2, col. 6, lines 63-64);
- D) 125 phr of paraffinic oil (as to instant claim 21, col. 6, lines 65-66; col. 7, line 9).
25. As one of the used block copolymers, a commercially available block copolymer Kraton G 1657, which is the same as cited as used in the instant invention (see [0069], Table 1 of the instant specification) is used in the composition of **Himes et al.**
26. The composition of **Himes et al** comprises superior tensile strength (col. 2, lines 38-40).

**27. Himes et al** fails to specify the composition further comprising a nucleating agent and a blowing agent; and specify the polypropylene resin as being a crystalline and having a MFR of 0.5-30 g/10 min.

**28. Leicht** discloses an elastomer composition which may be subject to a foamed extrusion procedure (col. 3, lines 35-40) comprising a mixture of block copolymers commercially available under a trademark of Kraton (col. 4, lines 50-63), a plasticizing oil (col. 3, lines 52-55) in combination with 0.25-5%wt of a nucleating agent (col. 5, lines 53-65) and blowing agents (col. 12, lines 55-56).

**29. Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising: a mixture of high molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer; and a medium molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer (p. 4, lines 21-25; p. 5, lines 1-4); a polypropylene homopolymer comprising a commercially available isotactic crystalline polypropylene Moplen C30G and endothermic foaming agents comprising a mixture of sodium bicarbonate and citric acid 22); and azodicarbonamide blowing agent ( p. 5, lines 20-24), wherein the composition of **Mariotti et al** comprises good adaptability to moulding processes (p. 3, lines 11-12).

30. Since **Mariotti et al** discloses the use of commercially available crystalline polypropylene polymers available under the trade name of Moplen, and high molecular weight and medium molecular weight block copolymers commercially available under the trade name of Kraton, therefore, it would have been obvious to a one of ordinary skill in the art at the time of the invention was made to substitute the Moplen C30G polypropylene polymer of **Mariotti et al** for analogous Moplen HP1078 or Moplen HP502L. Case law holds that the selection of a known material based on its suitability for its intended use supports prima facie obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

31. Since

1) **Himes et al** discloses a thermoplastic blend comprising two block copolymers of the formula ABA, wherein the block A comprises a styrene polymer and block B comprises a butadiene polymer; a polypropylene, and a paraffinic oil, but fails to specify the composition further comprising a nucleating agent and a blowing agent; and specify the polypropylene resin as being a crystalline and having a MFR of 0.5-30 g/10 min;

2) **Leicht** discloses an elastomer composition which may be subject to a foamed extrusion procedure comprising a mixture of block copolymers commercially available



under a trademark of Kraton, a plasticizing oil in combination with 0.25-5%wt of a nucleating agent and blowing agents (col. 12, lines 55-56);

3) **Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising: a mixture of high molecular weight thermoplastic elastomer comprising styrene-butadiene-styrene block copolymer and a medium molecular weight thermoplastic elastomer comprising styrene-butadiene-styrene block copolymer, a polypropylene homopolymer comprising a commercially available isotactic crystalline polypropylene Moplen C30G and endothermic foaming agents comprising a mixture of sodium bicarbonate and citric acid and azodicarbonamide blowing agent ( p. 5, lines 20-24), wherein the composition of **Mariotti et al** comprises good adaptability to moulding processes (p. 3, lines 11-12);

therefore,

it would have been obvious to include 0.25-5% of a nucleating agent, such as a mixture of sodium bicarbonate and citric acid of Mariotti et al, in combination with blowing agent in the composition of **Himes et al**, similar to the composition of **Leicht** to provide the composition of **Himes et al** with foamability property; and to use the crystalline polypropylene of **Mariotti et al** as a polypropylene component in the composition of **Himes et al** to improve the moldability of the composition of **Himes et al** (see p. 3, lines 11-12 in **Mariotti et al**).

32. The composition of **Himes et al** in view of **Leicht** and **Mariotti et al** is identical to the composition claimed in the instant invention, with all ranges of the components of

the composition of **Himes et al** in view of **Leicht** and **Mariotti et al** overlapping with the ranges of the components of the composition claimed in the instant invention. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

33. In addition, since the physical properties of the composition, including tensile strength, foamability, moldability, depend on specific ratio of the components in the composition, such limitations as the specific ratio between the two block ABA copolymers in the composition of **Himes et al** in view of **Leicht** and **Mariotti et al** and the specific amounts and molecular weights of the A and B blocks in each of the two ABA block copolymers, become a result effective variable, therefore, it would have been obvious to one skilled in the art at the time of the invention was made, to make variations in the content and molecular weight of each of the A and B blocks in the two ABA block copolymers of the composition of **Himes et al** in view of **Leicht** and **Mariotti et al** and the relative proportion of each of the ABA block copolymers to obtain the desired physical properties of the final composition, including tensile strength,

foamability and moldability. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

**34. Claims 13-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Himes et al** (US 4,880,878) in view of **Burnell** (US 5,272,182) and **Mariotti et al** (IT 1,317,261).

35. The discussion with respect to **Himes et al** (US 4,880,878) set forth in paragraphs 24-26 above, is incorporated here by reference.

**36. Himes et al** fails to specify the composition further comprising a nucleating agent and a blowing agent; and specify the polypropylene resin as being a crystalline and having a MFR of 0.5-30 g/10 min.

**37. Burnell** discloses a composition comprising:

- 1) a triblock styrene-diene-styrene copolymer;
- 2) and extending oil, and
- 3) 0.1-3%wt of a blowing agent comprising sodium bicarbonate-acid combination and nucleating agents (col. 8, lines 38-55; col. 5, lines 35-40).

**38. Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising:

a mixture of high molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer; and a medium molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer (p. 4, lines 21-25; p. 5, lines 1-4); a polypropylene homopolymer comprising a commercially available isotactic crystalline polypropylene Moplen C30G and endothermic foaming agents comprising a mixture of sodium bicarbonate and citric acid 22; and azodicarbonamide blowing agent ( p. 5, lines 20-24), wherein the composition of **Mariotti et al** comprises good adaptability to moulding processes (p. 3, lines 11-12).

39. Since **Mariotti et al** discloses the use of commercially available crystalline polypropylene polymers available under the trade name of Moplen, and high molecular weight and medium molecular weight block copolymers commercially available under the trend name of Kraton, therefore, it would have been obvious to a one of ordinary skill in the art at the time of the invention was made to substitute the Moplen C30G polypropylene polymer of **Mariotti et al** for analogous Moplen HP1078 or Moplen HP502L. Case law holds that the selection of a known material based on its suitability for its intended use supports prima facie obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency

is known to the prior art, the substitution of one equivalent for another is not patentable.  
See In re Ruff 118 USPQ 343 (CCPA 1958).

40. Since

1) **Himes et al** discloses a thermoplastic blend comprising two block copolymers of the formula ABA, wherein the block A comprises a styrene polymer and block B comprises a butadiene polymer; a polypropylene, and a paraffinic oil, but fails to specify the composition further comprising a nucleating agent and a blowing agent; and specify the polypropylene resin as being a crystalline and having a MFR of 0.5-30 g/10 min;

2) **Burnell** discloses a composition comprising a triblock styrene-diene-styrene copolymer, an extending oil, and 0.1-3%wt of a blowing agent comprising sodium bicarbonate-acid combination and nucleating agents (col. 8, lines 38-55; col. 5, lines 35-40).

3) **Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising: a mixture of high molecular weight thermoplastic elastomer comprising styrene-butadiene-styrene block copolymer and a medium molecular weight thermoplastic elastomer comprising styrene-butadiene-styrene block copolymer, a polypropylene homopolymer comprising a commercially available isotactic crystalline polypropylene Moplen C30G and endothermic foaming agents comprising a mixture of sodium bicarbonate and citric acid and azodicarbonamide blowing agent ( p. 5, lines 20-24), wherein the composition of **Mariotti et al** comprises good adaptability to moulding processes (p. 3, lines 11-12);

therefore,

it would have been obvious to include 0.25-5% of a nucleating agent, such as a mixture of sodium bicarbonate and citric acid of Mariotti et al, in combination with blowing agent in the composition of **Himes et al**, similar to the composition of **Burnell** to provide the composition of **Himes et al** with foamability property; and to use the crystalline polypropylene of **Mariotti et al** as a polypropylene component in the composition of **Himes et al** to improve the moldability of the composition of **Himes et al** (see p. 3, lines 11-12 in **Mariotti et al**).

41. The composition of **Himes et al** in view of **Burnell** and **Mariotti et al** is identical to the composition claimed in the instant invention, with all ranges of the components of the composition of **Himes et al** in view of **Burnell** and **Mariotti et al** overlapping with the ranges of the components of the composition claimed in the instant invention. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

In addition, since the physical properties of the composition, including tensile strength, foamability, moldability, depend on specific ratio of the components in the composition,

such limitations as the specific ratio between the two block ABA copolymers in the composition of **Himes et al** in view of **Burnell** and **Mariotti et al** and the specific amounts and molecular weights of the A and B blocks in each of the two ABA block copolymers, become a result effective variable, therefore, it would have been obvious to one skilled in the art at the time of the invention was made, to make variations in the content and molecular weight of each of the A and B blocks in the two ABA block copolymers of the composition of **Himes et al** in view of **Burnell** and **Mariotti et al** and the relative proportion of each of the ABA block copolymers to obtain the desired physical properties of the final composition, including tensile strength, foamability and moldability. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (MPEP 2144.05 II).

**42. Claim 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Burnell** (US 5,272,182) in view of **Himes et al** (US 4,880,878).

**43. Burnell** discloses a preblend comprising a styrene-diene-styrene triblock copolymer and a hydrocarbon extending oil (Abstract). The block copolymers can be hydrogenated, nonhydrogenated or partially hydrogenated (col. 3, lines 20-25). The molecular weight of the block copolymer is in the range of 100,000-350,000 and the copolymer comprises 1-45% pbw of vinyl aromatic compound (col. 4, lines 1-7).

**44. Burnell** fails to specify the molecular weight of the polystyrene blocks of the triblock polymer being 3-20 kg/mole.

**45. Himes et al** discloses a composition comprising a blend of commercially available block copolymer Kraton G 1657 with paraffinic oil and a polyolefin comprising polypropylene (see Tables 2, 3).

46. Since

1) **Burnell** discloses a preblend comprising a styrene-diene-styrene triblock copolymer having a molecular weight in the range of 100,000-350,000 and a hydrocarbon extending oil, but fails to specify the molecular weight of the polystyrene blocks of the triblock polymer being 3-20 kg/mole;

2) **Himes et al** discloses a composition comprising a blend of commercially available block copolymer Kraton G 1657 with paraffinic oil and a polyolefin comprising polypropylene (see Table 3);

3) Kraton G 1657 is disclosed in the instant specification as the appropriate low molecular weight block copolymer see [0069] of the instant specification);  
therefore,

it would have been obvious to a one of ordinary skill in the art at the time of the invention was made to use the commercially available low molecular weight block copolymer Kraton G 1657 of **Himes et al** and optionally polypropylene in the preblend of **Burnell**, as it would be obvious to substitute one equivalent for another known for the



same purpose (see MPEP 2144.06 II). As the polypropylene used in the blend, a commercially available crystalline polypropylene under a trademark Moplen may be used as well. Case law holds that the selection of a known material based on its suitability for its intended use supports prima facie obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

**47. Claims 13-25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Gergen** (US 3,865,776) in view of **Burnell** (US 5,272,182) and **Mariotti et al** (IT 1,317,261).

**48. Gergen** discloses a polymer composition comprising (as to instant claims 13-17):  
A) 100 pbw of a block copolymer having at least two monoalkenylarene polymer blocks and at least one substantially hydrogenated conjugated diene polymer block, said copolymer comprises 28-35%wt of monoalkenylarene blocks, each of the latter blocks having an average molecular weight of 20,000-35,000 (col. 2, lines 1-9);  
B) 5-50 pbw of a second block copolymer having at least two monoalkenylarene polymer blocks and at least one substantially hydrogenated conjugated diene polymer

block, said copolymer comprises 26-35%wt of monoalkenylarene blocks, each of the latter blocks having an average molecular weight of 8,000-15,000 (col. 2, lines 9-15);

C) 75-250 pbw of mineral oil;

D) 10-50 pbw of polypropylene having MFR of less than 14 g/10 min (Col. 2, lines 16-18).

As to instant claims 15-16, the composition comprises polystyrene-hydrogenated polybutadiene-polystyrene blocks (col. 3, lines 58-62).

49. Though **Gergen** does not specify the apparent molecular weights of the block copolymers (A) and (B), nevertheless, since the copolymers (A) and (B) of **Gergen** are identical to the copolymers claimed in the instant invention, the percentage and molecular weight of the monoalkenylarene polymer blocks in the copolymers (A) and (B) of **Gergen** are within the same ranges as the corresponding copolymers claimed in the instant invention, therefore, it would have been obvious to a one of ordinary skill in the art at the time of the invention was made that the apparent molecular weights of the copolymers (A) and (B) of **Gergen** will be within the same ranges as apparent molecular weights of the corresponding copolymers claimed in the instant invention.

50. **Gergen** fails to specify the polypropylene resin being a crystalline polymer having softening point of 130-180°C, and the composition further comprising 0.01-3%wt of blowing agent and nucleating agent and the foamed article produced from the composition.

**51. Burnell** discloses a composition comprising:

- 1) a triblock styrene-diene-styrene copolymer;
- 2) and extending oil, and
- 3) 0.1-3%wt of a blowing agent comprising sodium bicarbonate-acid combination and nucleating agents (col. 8, lines 38-55; col. 5, lines 35-40).

**52. Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising: a mixture of high molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer; and a medium molecular weight thermoplastic elastomer comprising styrene/ethylene/butylene/styrene or styrene-butadiene-styrene block copolymer (p. 4, lines 21-25; p. 5, lines 1-4); a polypropylene homopolymer comprising a commercially available isotactic crystalline polypropylene Moplen C30G and endothermic foaming agents comprising a mixture of sodium bicarbonate and citric acid 22; and azodicarbonamide blowing agent ( p. 5, lines 20-24), wherein the composition of **Mariotti et al** comprises good adaptability to moulding processes (p. 3, lines 11-12).

53. Since **Mariotti et al** discloses the use of commercially available crystalline polypropylene polymers available under the trade name of Moplen, and high molecular weight and medium molecular weight block copolymers commercially available under the trend name of Kraton, therefore, it would have been obvious to a one of ordinary

skill in the art at the time of the invention was made to substitute the Moplen C30G polypropylene polymer of **Mariotti et al** for analogous Moplen HP1078 or Moplen HP502L. Case law holds that the selection of a known material based on its suitability for its intended use supports prima facie obviousness. *Sinclair & Carroll Co vs. Interchemical Corp.*, 325 US 327, 65 USPQ 297 (1045).

Case law holds that the mere substitution of an equivalent (something equal in value or meaning, as taught by analogous prior art) is not an act of invention; where equivalency is known to the prior art, the substitution of one equivalent for another is not patentable. See *In re Ruff* 118 USPQ 343 (CCPA 1958).

54. Since

1) **Gergen** discloses a polymer composition comprising a) 100 pbw of a block copolymer having at least two monoalkenylarene polymer blocks and at least one substantially hydrogenated conjugated diene polymer block, said copolymer comprises 28-35%wt of monoalkenylarene blocks, each of the latter blocks having an average molecular weight of 20,000-35,000 ; b) 5-50 pbw of a second block copolymer having at least two monoalkenylarene polymer blocks and at least one substantially hydrogenated conjugated diene polymer block, said copolymer comprises 26-35%wt of monoalkenylarene blocks, each of the latter blocks having an average molecular weight of 8,000-15,000; c) 75-250 pbw of mineral oil; d) 10-50 pbw of polypropylene having MFR of less than 14 g/10 min; but fails to specify the polypropylene resin being a crystalline polymer having softening point of 130-180°C, and the composition further

comprising 0.01-3%wt of blowing agent and nucleating agent and the foamed article produced from the composition;

2) **Burnell** discloses a composition comprising a triblock styrene-diene-styrene copolymer, an extending oil, and 0.1-3%wt of a blowing agent comprising sodium bicarbonate-acid combination and nucleating agents (col. 8, lines 38-55; col. 5, lines 35-40).

3) **Mariotti et al** discloses a foamed thermoplastic elastomeric material comprising: a mixture of high molecular weight thermoplastic elastomer comprising styrene-butadiene-styrene block copolymer and a medium molecular weight thermoplastic elastomer comprising styrene-butadiene-styrene block copolymer, a polypropylene homopolymer comprising a commercially available isotactic crystalline polypropylene Moplen C30G and endothermic foaming agents comprising a mixture of sodium bicarbonate and citric acid and azodicarbonamide blowing agent ( p. 5, lines 20-24), wherein the composition of **Mariotti et al** comprises good adaptability to moulding processes (p. 3, lines 11-12);

therefore,

it would have been obvious to include 0.25-5% of a nucleating agent, such as a mixture of sodium bicarbonate and citric acid of **Mariotti et al**, in combination with blowing agent in the composition of **Gergen**, similar to the composition of **Burnell** to provide the composition of **Gergen** with foamability property; and to use the crystalline polypropylene of **Mariotti et al** as a polypropylene component in the composition of

**Himes et al** to improve the moldability of the composition of **Gergen** (see p. 3, lines 11-12 in **Mariotti et al**).

55. The composition of **Gergen** in view of **Burnell** and **Mariotti et al** is identical to the composition claimed in the instant invention, with all ranges of the components of the composition of **Gergen** in view of **Burnell** and **Mariotti et al** overlapping with the ranges of the components of the composition claimed in the instant invention. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irina Krylova whose telephone number is (571)270-7349. The examiner can normally be reached on Monday-Friday 7:30am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasudevan Jagannathan can be reached on (571)272-1119. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

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